Successful Methods

A Magazine of Construction Service

Published by SUCCESSFUL METHODS, Inc.

S. T. HENRY, President — WILLIAM JABINE, Secretary and Editorial Director

141 Centre St., New York City, N. Y.

Vol. 7 — MAY, 1925 — No. 5

Front

IN these days of automobiles, boiled shirts and tailor-made clothes, the idea of putting on front seems generally overdone. But it is astonishing to find, in going from job to job, how many construction outfits allow their camps and equipment to run down. Many of them appear as though the boss was off on a bat. Nor is it the losing jobs alone, by any means, where these conditions are met. Even the money makers seem too often to overlook the value of well-kept camps and equipment.

Now, by well-kept we do not mean red, sport-model automobiles, mahogany furniture and tablecloths. What we do mean is a camp free from litter, tin cans, abandoned tools, broken down equipment and cast-off plunder generally. We also mean absence of haywire on the equipment. Paint applied judiciously fits into the scheme of the kind of camps we have in mind. It tones things up astonishingly.

A surprisingly small amount of labor and very little other expense, both properly placed, mean the difference between a good and a poor impression. The point-of-view of the boss counts more than all else.

Take a man who just naturally keeps up the appearances of his outfit. He spends little or no more money than the fellow who lets things slide. In fact, the man in charge of the run down outfit nearly always just wastes a lot of time. He cannot even find time to shave. He is to busy doing nothing. It is the really busy, successful man who has time and energy to keep things shipshape.

This idea of cleaning up an outfit was tried recently on a small job that comes under our close observation. To begin with, things were a mess. The camp was an eyesore. It would have passed for a small-town dump. Tools were scattered everywhere—generally missing when wanted most. Except on Saturday afternoon and Sunday, the crew looked like a lot of bums.

Under these conditions, the superintendent was changed about four months ago. The difference now as compared with then scarcely can be overstated. The camp is inviting instead of repulsive. Tools are put away when work stops. The equipment looks as though it belonged to a man who was proud of it. The most important effect has been on the crew. Those who were just naturally bums have gone. The balance have braced up wonderfully.

What did it cost? Mainly inspiration and leadership from the boss. Then a little work done regularly when the outfit could not all be kept busy, or on wet days. No account has been kept of the cost, but the total has been small.

Even though the cost had been considerable, the money would have been well spent. The difference in the attitude of the crew toward the job is alone worth a lot. There is no question but that the business standing of the outfit has been raised. The unit cost figures also have been cut since the change.

It does not cost money, in the long run, to clean up. It does cost money to neglect appearances.

One Big Highway Problem

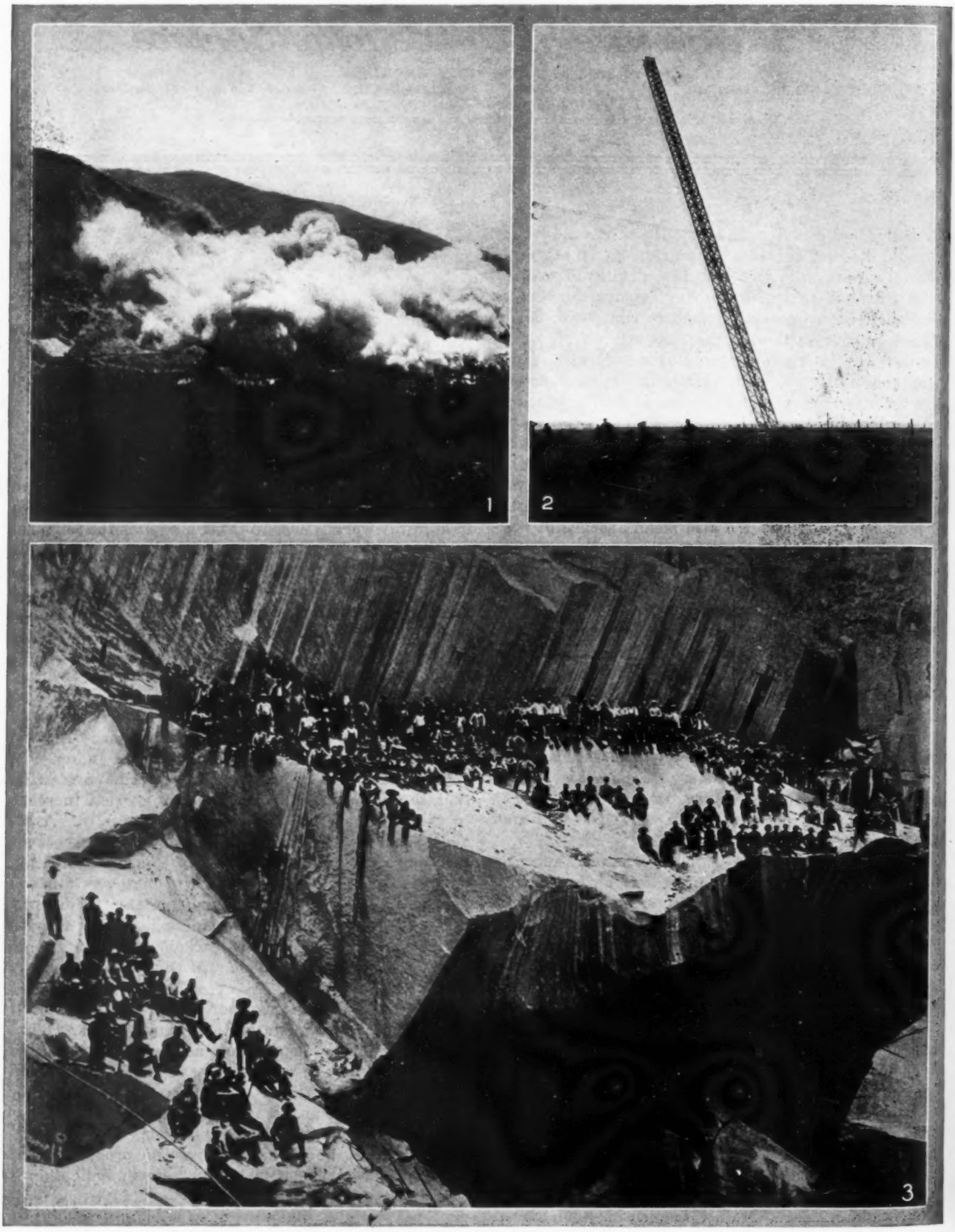
ANY constructive industry of the magnitude that highway building has reached is naturally bound to have many serious problems. Every man engaged in highway work is sure to think his job is the toughest nut to crack. That is human nature. But conditions rapidly are forcing all of us to realize that maintenance has already assumed proportions far beyond anything the layman can grasp. In fact, few highway builders appreciate the amount of money that maintenance work already is taking. Even fewer sense what is dead ahead in the expense of keeping road surfaces in good condition.

The astonishing growth in motor vehicle travel is responsible for the maintenance situation. Anyone who reads, knows of the unheard rate of increase in the number of cars and trucks. Few have realized that there has been an accompanying great increase in the mileage each vehicle travels annually. Average speed also has reached a rate far in excess of the figure of a short while ago. The multiplication of these increases gives a rate of highway surface destruction many times greater than this factor was a few years ago. This pyramiding is almost certain to increase rather than to slacken. The magnitude of the maintenance problem will thus become rapidly greater.

There is practically no more surplus war material to be allotted to the states for highway work. What is worse, much of such equipment that was allotted has reached to the retirement stage. The provision of the equipment required thus becomes a matter of serious proportions. Paying for the necessary materials and labor is still more serious.

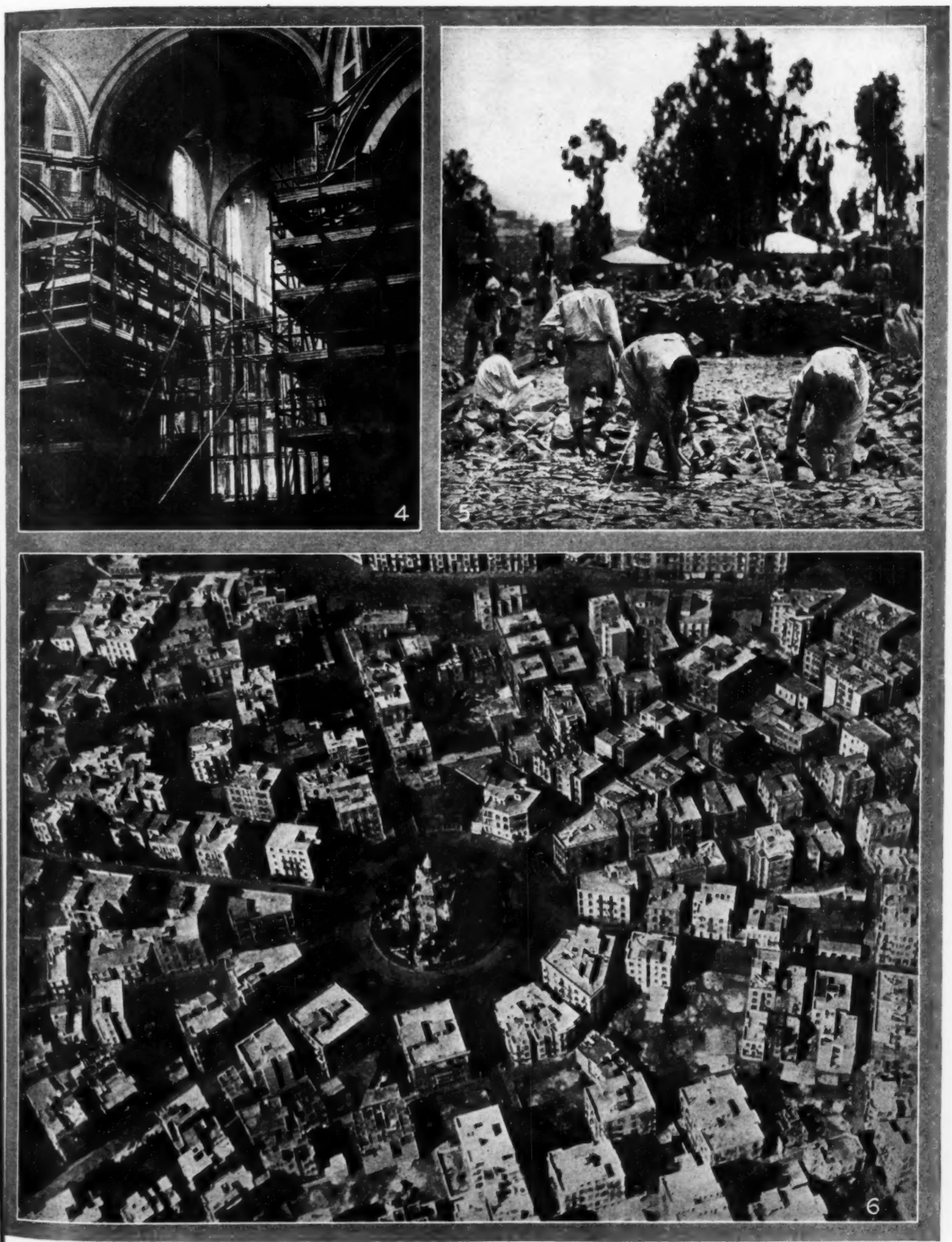
Means must be found to solve the problem. The country is permanently motorized. Every indication is that the increase in the use of cars and trucks will continue rapidly. Business of every kind is more and more dependent on highway transport. The way must be kept open. Certainly a problem for real men.

Variety Is the Rule



1. A big blast on a Western mountainside. © *P. & A. Photos.*
2. Taking down a big radio tower at Inglewood, Cal. The underpinning of the high steel structure was cut through and the tower pulled down. © *P. & A. Photos.*
3. Vermont claims that the piece of granite shown in the photograph is the largest ever cut. It weighed 6900 lb. © *P. & A. Photos.*

In Construction Field



4. Repair work in progress in the interior of St. Paul's Cathedral, London. © *Keystone.*
5. Abyssinia has joined the good roads movement. This photograph shows some of the more or less active workmen on the job. © *International.*
6. One of the newer sections of Cairo showing good planning of streets and modern buildings. © *International.*

CLEARING SITE FOR NEW BUILDING

A Little Dynamite Judiciously Employed Razes Old Furnace

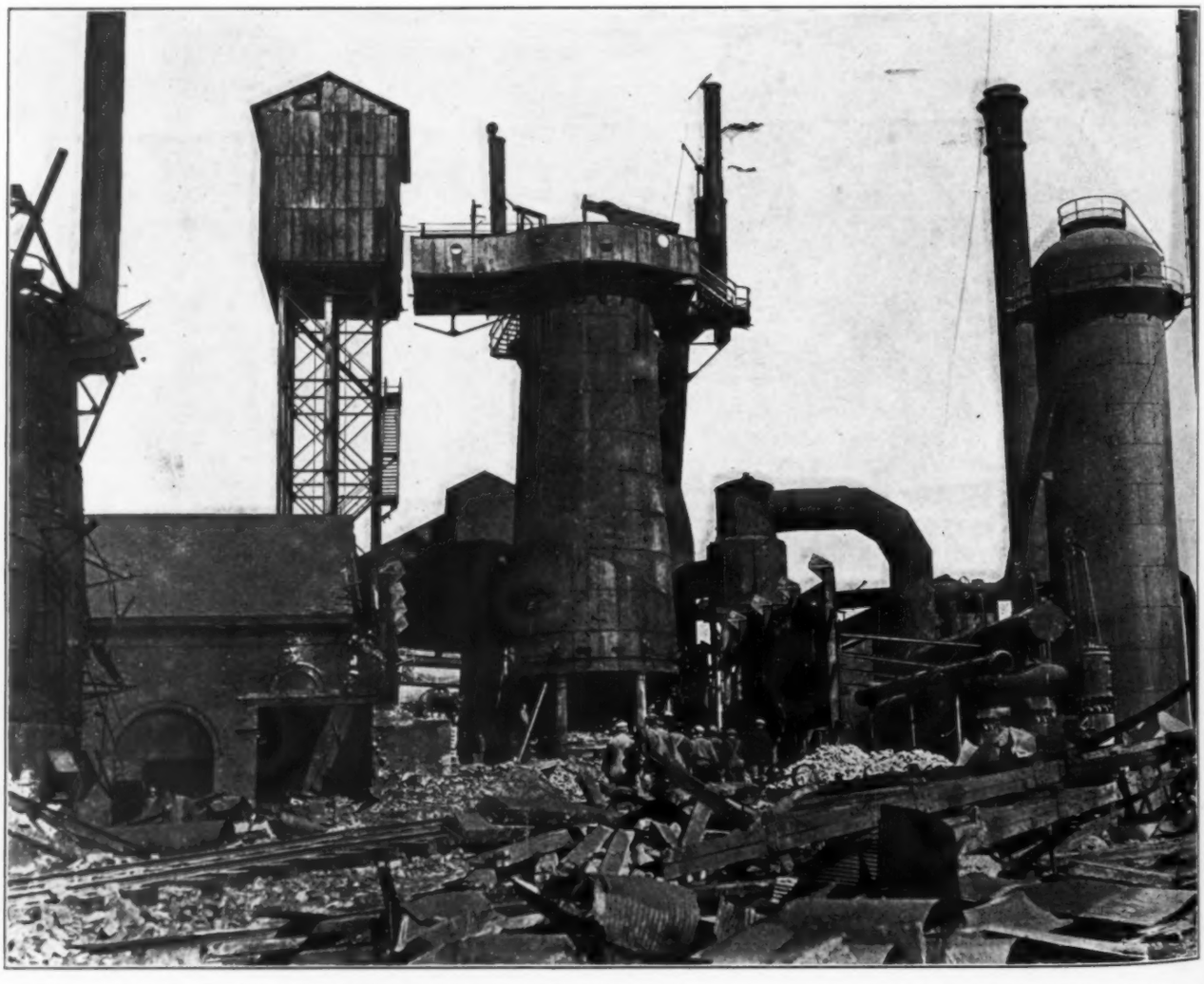
DYNAMITE is a useful and inexpensive tool when carefully used and properly applied. This fact was made evident recently at Troy, N. Y., where a disused coke furnace of the Hudson Valley Coal & Coke Company had to be razed in order to provide room for a new plant, which when completed will cost $5,000,000.

PLACING DYNAMITE IN BASE OF PILLAR

The furnace which was razed is shown in the large photograph at the bottom of this page. It was 100 ft. in height, 20 ft. in diameter, lined with 15,000,000 bricks and weighed about 3500 tons. The photograph was taken after the brick work supporting the steel casing at the bottom of the furnace had been torn down on one side in order to weaken it so the direction of the furnace's fall could be decided in advance.

In addition, the steel framework had been cut away with acetylene torches and one pillar on each side had been blasted out. Holes were then cut in the bottom of the supporting pillars and dynamite placed in them.

The small photograph on page 4 shows Mr. Pollock, of the Myer Pollock organization of Pottstown, which was handling the job, placing the dynamite. The two



THE FURNACE BEFORE THE BLAST, AFTER SUPPORTING PILLARS AND BRICK WORK HAD BEEN CUT AWAY

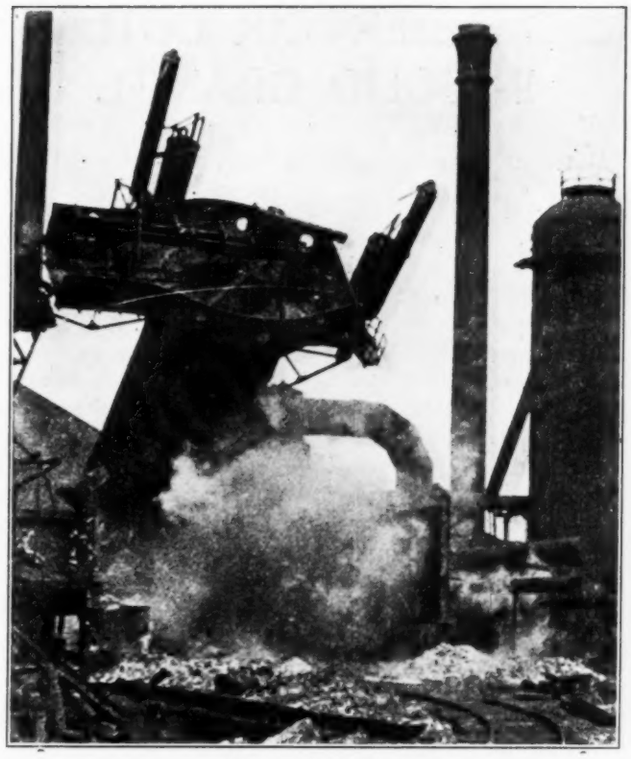
photographs on this page show what was accomplished. The upper photograph, taken at the moment of the explosion, shows the furnace falling, and the lower picture shows the destruction wrought by the dynamite.

The dynamite was placed in five bundles of four cartridges each at intervals around the inside wall of the furnace, each bundle being primed with an electric blasting cap. The holes in the bases of the pillars were filled with mud which was heaped on the dynamite to a depth of 4 in. Charges of dynamite also were placed on the top plates of the pillars and were covered with mud.

Connecting wires joined all of the electrical blasting caps in the dynamite cartridges so that all could be fired simultaneously. Sections of steel smokestack filled with brick were placed in front of each pillar in order to prevent the fragments of steel from damaging nearby buildings.

The entire job went through without a hitch and the furnace fell exactly as planned. The dynamite did its work quickly and effectively, leaving the furnace in such shape that the débris could be removed in order to clear the site.

The economy of the process is well illustrated by the fact that the cost of the dynamite used in destroying this big furnace was exactly $6.54.



THE EXPLOSION

HOW THE BIG FURNACE LOOKED AFTER THE DYNAMITE HAD FINISHED ITS JOB

INSTALLING RESERVOIR OUTLET WORKS IN SOLID GRANITE

Outlet Capacity of Lake Cheesman, Denver's Great Reservoir, Increased Approximately 70 Per Cent

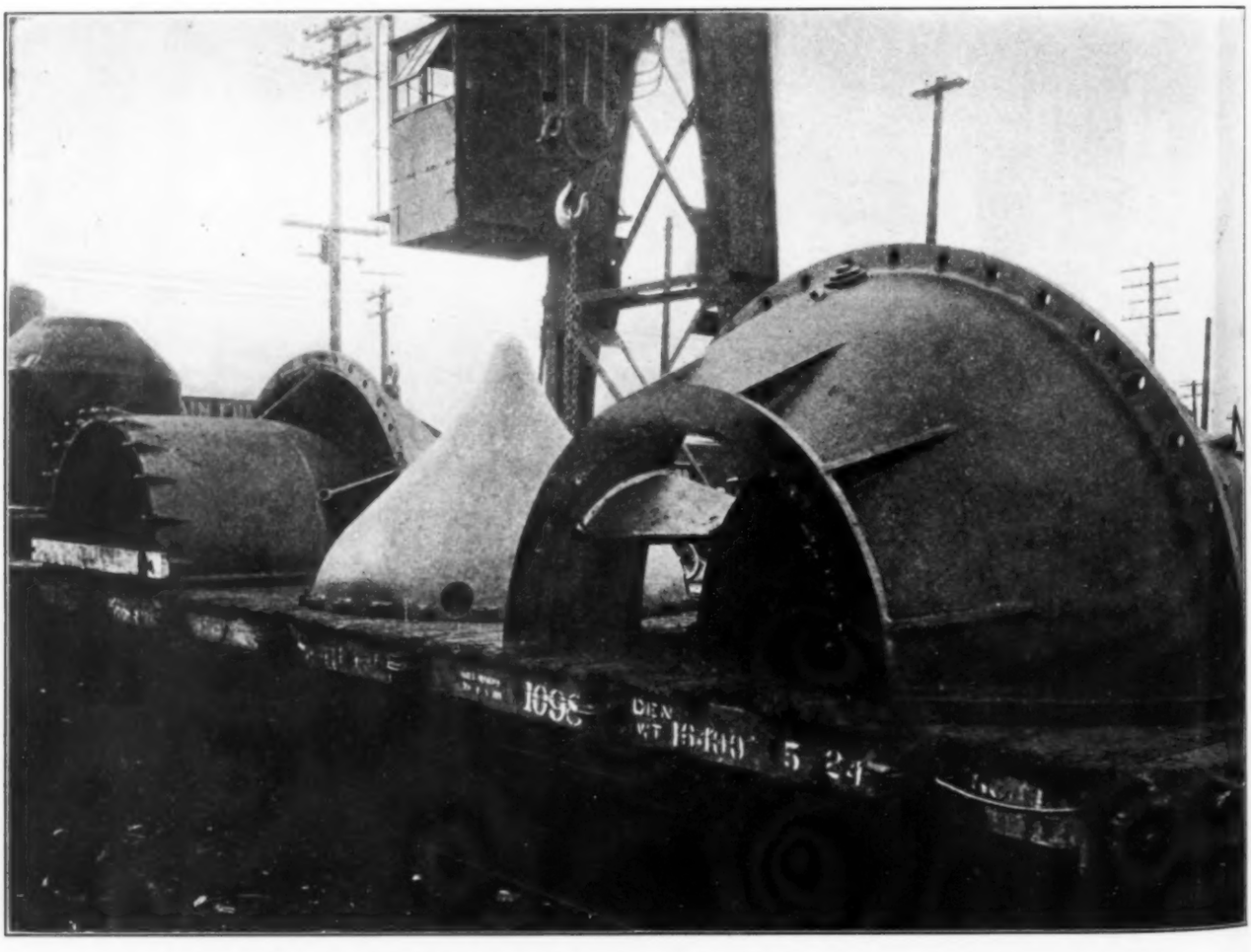
ONE of the most interesting jobs under way by the Denver Board of Water Commissioners, as a part of their $7,000,000 program of improvements and extensions, is the installation of additional outlet works at Lake Cheesman. A 62-in. needle valve and a 5 by 7 emergency slide gate, together with the necessary castings, are being installed in a new outlet tunnel, 190 ft. long, excavated through solid granite. When the job is completed, as it will be in the next few weeks, the outlet capacity will be increased from about 1400 to about 2400 sec. ft., approximately 70 per cent.

Lake Cheesman is the 26,000,000,000 gallon storage reservoir which forms the basis of Denver's water supply system. It is located on the south fork of the South Platte River, about 50 mi. southwest of Denver, and is created by the Cheesman Dam, a curved gravity structure, 230 ft. high, built of granite blocks. This dam was constructed about 20 years ago.

The main problems involved in the installation of the additional outlet works were excavating the tunnel and access shafts; hauling 75 tons of castings, some pieces weighing as much as 13.5 tons, by truck, 20 mi. over mountain roads; completing the tunnel excavation at the reservoir end and placing the emergency valve while the water was below the tunnel level.

E. T. Williams of Victor, Colo., did the rock excavating, by contract, at a unit price of 50 cents a cu. ft. Eight men, using two pneumatic drills, loosened and removed about 6 lin. feet of 10 by 10-ft. tunnel daily. The cross section was drilled in checkerboard fashion, spacing 40 holes about 1.5 ft. apart and drilling them about 4.5 ft. deep; and was shot with gelatine, using from 100 to 125 pounds of 40 per cent sticks in each shot.

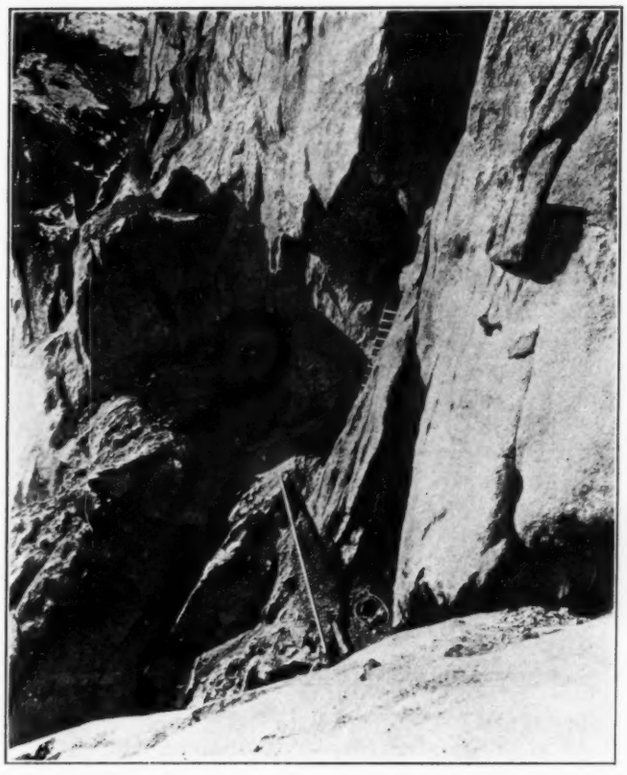
The valves, the steel and semi-steel linings which surround the valves and which form the conduit between the two, and the concrete linings, are being



CASTINGS FOR 62 IN. NEEDLE VALVE WHICH HAD TO BE HAULED OVER MOUNTAIN ROADS

placed by force account. Since the installation of the emergency gate is completed the critical stage, as regards reservoir water level, is past. This valve is located at the foot of a 11 by 11 ft. vertical shaft, excavated just upstream from the centerline of the dam. Consequently it could be lowered into place through the shaft. The needle valve, being located at the outlet end of the tunnel, must be lowered over the vertical rock cliff shown in one of the accompanying photographs.

Both valves are operated by hydraulic pressure, and both are supplied with air vents so as to prevent vacuum troubles. The emergency gate closes automatically whenever the pressure rises. It will not be operated except in emergencies or for test purposes. Control mechanism can be reached by steps descending the vertical shaft, or through a 5 by 7-ft. manway near the outlet end.



THE TUNNEL WAS PUT THROUGH THIS SORT OF ROCK. THE OUTLET MAY BE SEEN TO THE RIGHT OF THE MAN

The photograph on the cover of this issue of SUCCESSFUL METHODS shows the up-stream side of the Cheesman Dam at the time the work was going on. Part of the contractor's plant may be seen in the center of the photograph and the big castings may also be seen.

The total cost of the work will be about $75,000 dollars. Burton Lowther is chief engineer of the Denver Water Commission. T. J. Leahy, assistant engineer, and D. D. Gross, office engineer, furnished the foregoing information.

CASTINGS FOR THE BIG EMERGENCY SLIDE GATE

LOUISIANA CONSTRUCTS SINGLE SPAN BRIDGE OVER MERMENTAU RIVER

Highway Commission Eliminates Gap in Route Between New Orleans and Texas Line

By N. E. LANT
Bridge Engineer, Louisiana Highway Commission

LAST Fall, the exact date is September 26, Louisiana formally opened the highway bridge over the Mermentau River between Acadia and Jeff Davis Parishes, marking the successful completion of one of the most difficult tasks which confronted the present State Highway Commission when it took office in 1922.

EAST PORTAL OF THE NEW BRIDGE

The Mermentau River up to the present time had never been bridged for highway traffic, the only crossing being the railroad bridge on the Southern Pacific Lines at Mermentau Station, which is a single track through a span of 206 ft. with a plate girder swing of 120 ft. Due to the fact that the drainage basin of the river is very low and swampy, except near the Southern Pacific crossing, there was no choice of location and it was decided to build the highway bridge approximately 240 ft. north, or upstream from the Southern Pacific bridge. The cross section of the stream at this point is very regular and at extreme low water stage or elevation 0.3 ft., which is 0.3 ft. above mean Gulf level, the depth of water in mid channel is 55 ft., and the natural banks are on a slope about 1 ft. horizontal to 5 ft. vertical up to low water surface and about 4 ft. above.

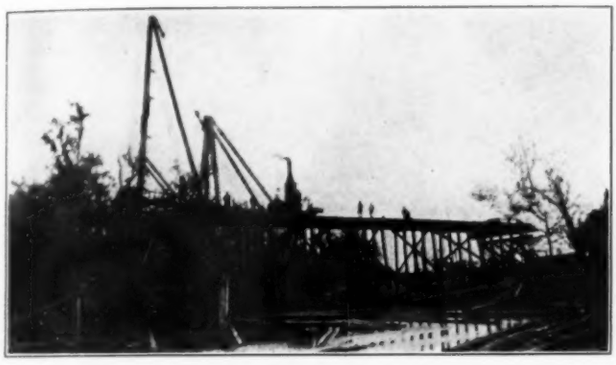
There has been considerable navigation in the river and it is considered navigable by the War Department. The boats using the river, however, are small tugs and oil barges which bring out crude oil from the Jennings oil fields and move rice from rice plantations upstream to railroad at Mermentau. The first permit obtained from the War Department for bridging the river provided for a 90-ft. clear opening approximately in mid channel.

Plans were prepared in 1919 and 1920 providing for

BUILDING EAST APPROACH WITH WHEELED SCRAPERS

a steel swing span having 90 ft. clear opening and a roadway placed at approximate elevation 17.0 or approximately 5 ft., above maximum high water. Bids were not asked for on this plan because of lack of funds available at the time. However, in 1922, the project was reopened and a new design prepared similar to the first, except that in addition to the swing span design a vertical left span alternate design was prepared. Bids were then taken in spring of 1923, but were so much in excess of estimated cost that all bids were rejected.

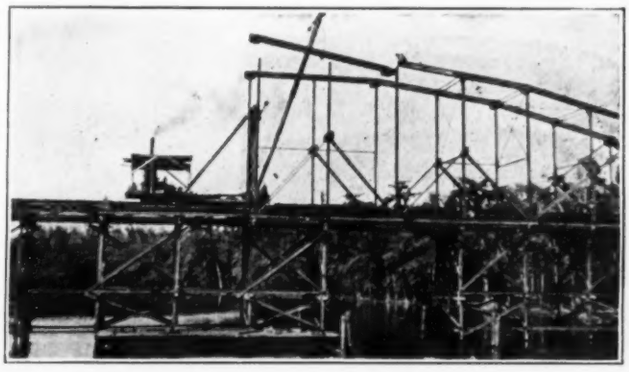
After a careful study had been made of the entire situation it was decided that any plan employing the



PUTTING UP APPROACH TO BRIDGE

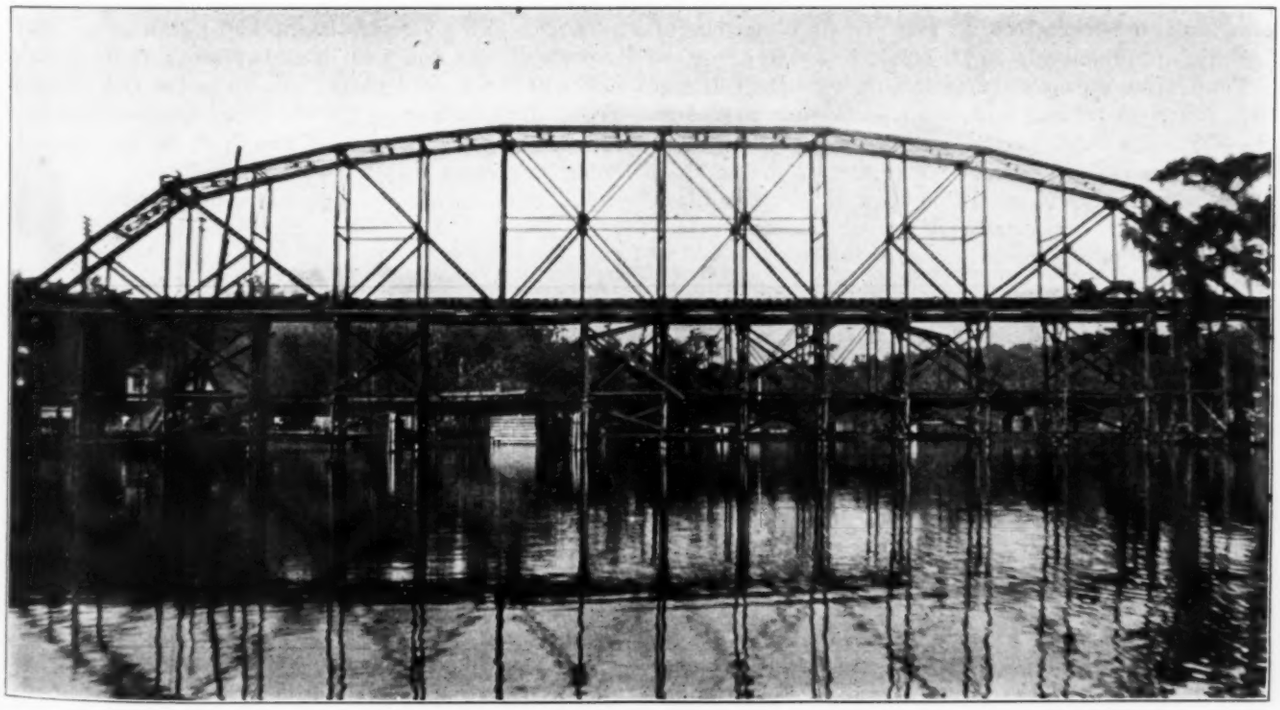
use of piers in the vicinity of mid channel would be out of the question as the bids already taken clearly indicated that the cost of the substructure would be disproportionate to the cost of the superstructure. Accordingly an application was submitted to the War Department requesting permission to construct the bridge as a single fixed span 230 ft. long with a 20 ft. vertical clearance above high water, as present river traffic could be accommodated with this clearance. A permit was obtained after a public hearing had been held and no objections were made.

Plans were prepared, approved by the Bureau of Public Roads, and work advertised. Bids were received and the contract awarded December, 1923. The contractors started actual work March 1, 1924, and completed the project on September 15, approximately 2 months ahead of contract time.



ERECTING STEEL ON MAIN SPAN

The unusual features of the construction are the 320 ft. riveted span which is rather long for a bridge of this size, and the height above low water of 32 ft., which is very unusual in a low, flat country like southwest Louisiana. Creosoted piling in the approaches varied from 35 ft. to 65 ft., and in the falsework for channel span 85-ft. untreated pine piling were used to support pony bents. A 40-ft. clear horizontal opening was maintained in falsework during



THE STEEL SPAN 320 FT. IN LENGTH DURING CONSTRUCTION

THE MERMENTAU RIVER BRIDGE SHOWING STEEL SPAN AND CREOSOTED PILE TRESTLES FORMING THE APPROACHES

erection of main span by carrying one panel point of truss on 27-in. I-beams 43 ft. long.

The two main piers were constructed in open steel sheet pile cofferdams. The steel sheet piling were all set up, driven to a penetration approximately 8 ft., and excavation was made by clamshell bucket mounted on a barge derrick. The excavation followed the steel sheet piling down and no trouble was encountered in excavating to the proposed bottom of footing, approximately 26 ft. below low water.

Foundation piling 40 ft. in length were then driven to a practical refusal and concrete footing poured in the dry. As soon as the pier stem had been constructed several feet above water elevation, the steel sheet piling was pulled. The work on the two piers was carried on at the same time the pile driver was driving the pile approaches and falsework for the steel span so that when the second pier was completed erection was started on the steel span without delay.

The entire cost of the project as finally completed including earth work, approaches and gravel surfacing on same, amounted to approximately $170,000, which is approximately $80,000 less than the cost would have been if bids on open span bridge had been accepted. The saving in maintenance and bridge tenders' salaries is considerable and highway traffic can pass without interruption from river traffic.

The completion of this bridge links up a stretch of surfaced highway 295 miles long, from New Orleans to the Texas state line. This is one of the most important highways in Louisiana and a link in the most important east and west highway along the southern limits of the United States, known as the Old Spanish Trail. By eliminating the old ferry crossing and two railroad grade crossings of the S. P. R. R., highway traffic is able to pass without interruption.

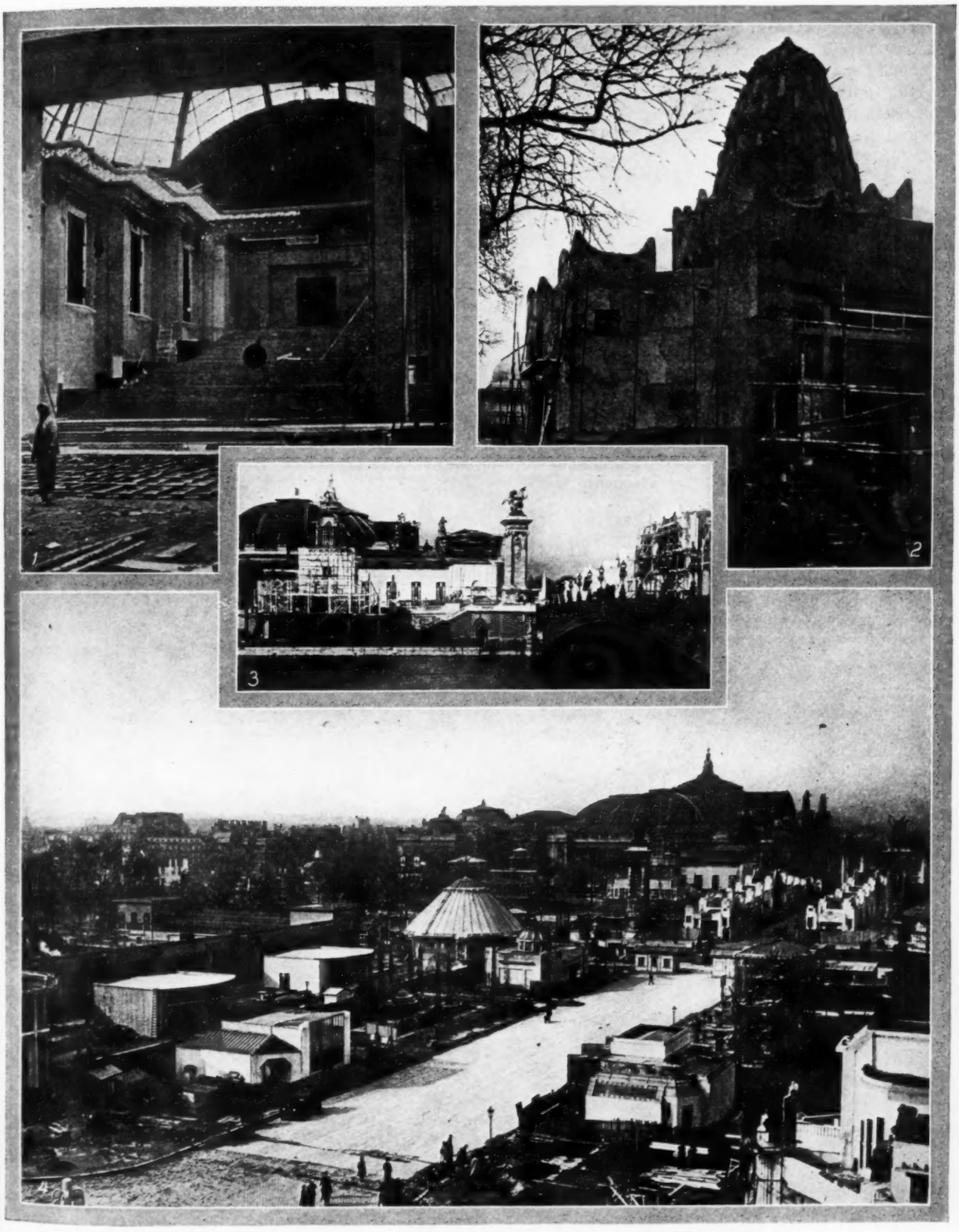
All engineering including design, specifications, plans and field supervision were handled by the Bridge Department of the Louisiana Highway Commission. The Missouri Valley Bridge & Iron Co., of Leavenworth, Kan., was the general contractor, with C. F. Griever in charge as superintendent of construction for the contractor, and E. L. Erickson, resident engineer for the Louisiana Highway Commission.

DELEGATES TO PAN-AMERICAN ROAD CONGRESS APPOINTED

PRESIDENT COOLIDGE announced recently the appointment of the delegates from the United States who will attend the Pan-American Road Congress at Buenos Aires next October. The delegation will consist of seven men, all of whom have been identified with highway work or with Spanish-American relations. The Congress will be held Oct. 3 to 13, and will be attended by delegates from both North and South America.

The members of the United States delegation are: J. Walter Drake, Assistant Secretary of Commerce, chairman; Charles M. Babcock, Commissioner of Highways, Minnesota; F. L. Bishop, Dean, School of Engineering, University of Pittsburgh; William E. Hull, Member of Congress from Peoria, Ill.; Thomas H. McDonald, Chief, U. S. Bureau of Public Roads; Frank Page, Chairman, North Carolina State Highway Commission, and Dr. G. A. Sherwell, Secretary-General, Inter-American High Commission.

Paris to Hold Exhibition of Decorative Arts

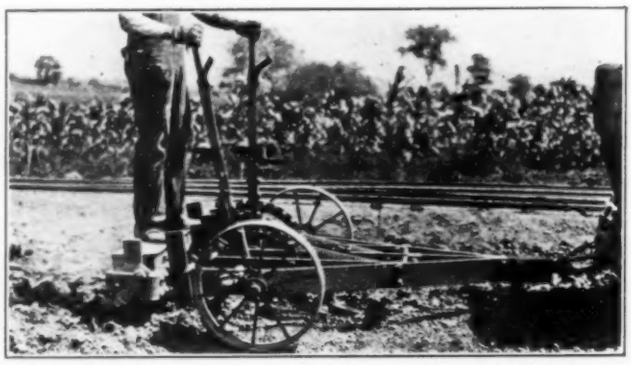


1. Interior of the Grand Palais which has been reconstructed for the Exposition. © *P. & A. Photos.*
2. The African Pavilion. © *Keystone.*
3. A view of part of the Exposition looking over the Seine. © *International.*
4. General view of the Exposition. © *International.*

MODERN METHODS OF FINE GRADING

Accurate Results Obtained by Use of Machine Designed for Such Work

ALTHOUGH contractors have been quick to realize the advantages and to apply improved methods in mixing, placing and finishing concrete for road construction, they have not been so quick, as a general rule, to take advantage of improved methods and equipment for fine grading.

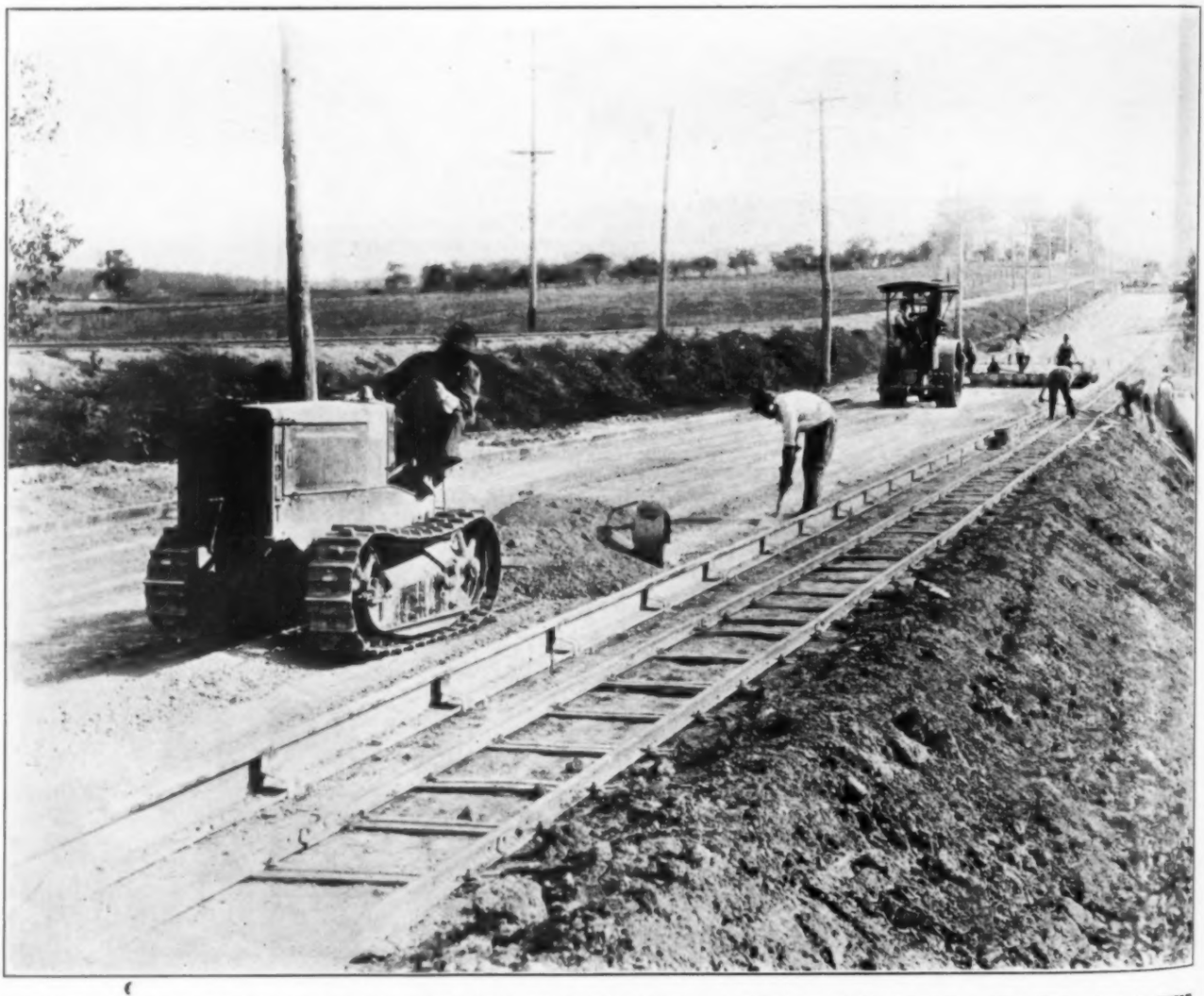


THE FIRST STEP—SCARIFYING THE SUBGRADE

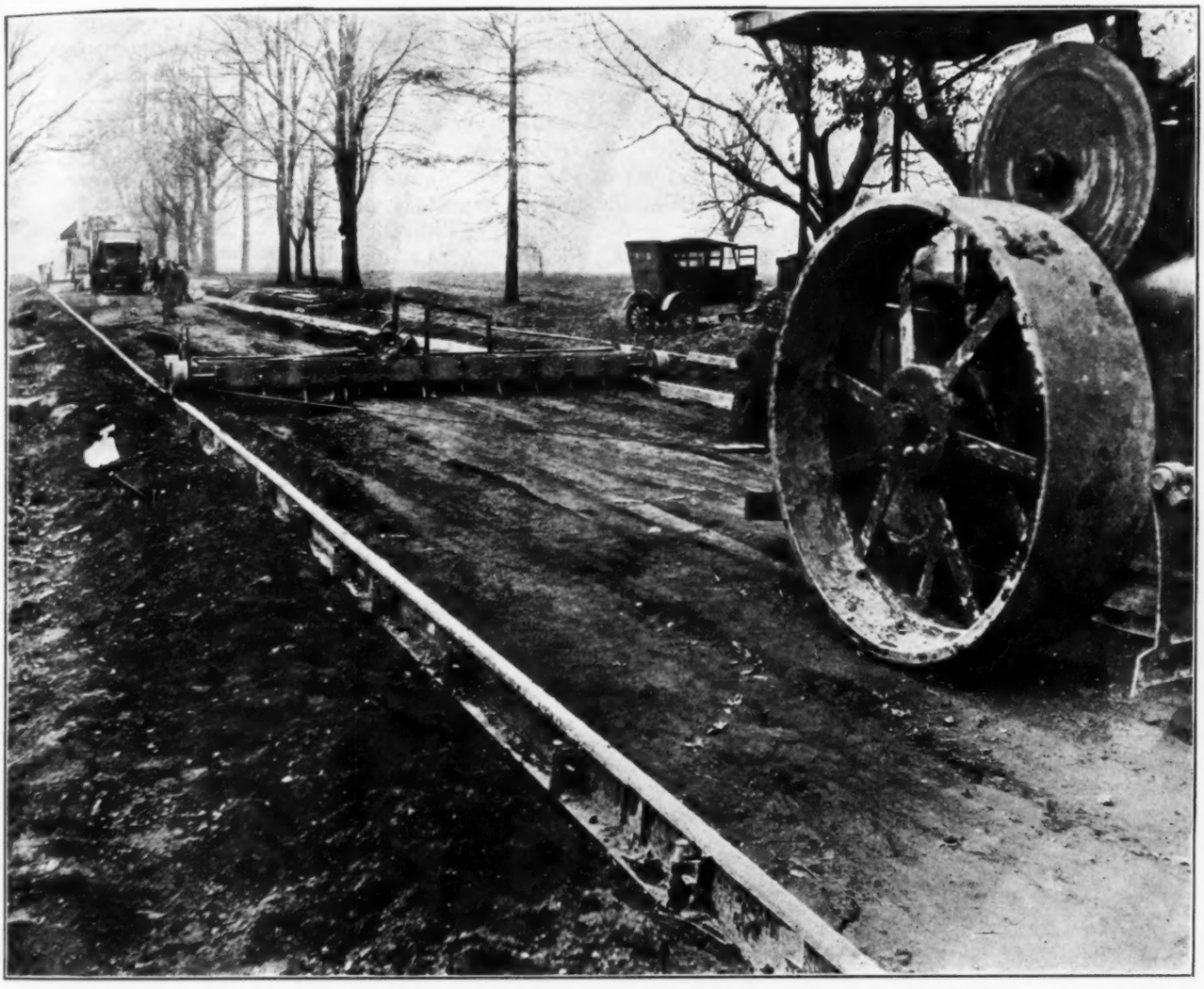
Specifications are insisting more rigidly than ever before upon an accurate subgrade. They call for the testing of the subgrade with a spike or screw templet immediately before the concrete is placed. Any high spots must be removed, and the contractor who depends upon the pick and shovel or blade grader methods of fine grading very often finds that his grade averages low even after an excessive amount of labor.

The expense of this is not often taken into consideration, and few contractors realize that if the subgrade averages only ¼ in. low, which is conservative, when prepared by hand or blade grader methods, an additional 73 cu. yd. of concrete per mile of 18 ft. road.

This is concrete which the contractor must furnish and pay for himself. He gets no estimates for it, and



MOVING EXCESS MATERIAL LEFT IN WINDROWS BY SUBGRADER. A FRESNO HAULED BY A TRACTOR DOES THIS PART OF THE JOB



CUTTING THE SUBGRADE WITH A STEEL SUBGRADER

the expense to him will be near $15 a cu. yd. or approximately $1,000 a mile. This is money out of his pocket and cuts down the profits from the job, and is one of the causes which is sometimes so hard to find that makes a job show a much smaller margin of profit than the contractor had anticipated.

Improvements have been made in machines for fine grading and those contractors who have taken advantage of them have definitely proved that the saving is much worth while.

An accurate subgrade can be prepared with a minimum amount of labor by planing the subgrade to exact cross section with a subgrader, which is a steel or wood frame riding on the side forms, and which carries on its under side a series of steel blades set to the exact crown required in the subgrade.

When a subgrader is to be used the rough grade is left from 1 to 2/10 in. high. Forms are then set and the subgrader pulled by a roller or tractor for the first cut. For this first cut the blades of the subgrader are set high so that they will cut where high spots exist and show immediately where low places must be corrected before the grade is completed.

This service as a templet is one of the most valuable features of the subgrader. It permits the contractor to move the excess dirt from the high places to the low places with a minimum of effort. There is no need of wasting dirt outside of the forms and later being compelled to bring it in for the low places.

After the correction of the subgrade has been completed, successive cuts are made with the subgrader until the grade is to exact depth and contour. Very fine working adjustments are possible with the modern subgrader, so that the grade can be planed to the exact depth required and no deeper. This work can be done in a minimum of time and means a tremendous saving in labor plus the assurance of a true grade.

Many contractors using trucks for haulage have failed to realize that the subgrader can be used on their jobs without interference with haulage operations.

As a matter of fact, 80 per cent of the subgraders now in use are on such work. Subgrading is done in the morning, at noon and in the evening, when hauling is not in progress. A total of from one to three hours' use of the subgrader per day is sufficient to complete the fine grading for the entire day's run.

When the subgrader is not in use, it is moved to one side of the road out of the way by simply turning it in the middle of the road on the pedestal which is

used for reversing it, or to allow for passage of the roller, then lowering the subgrader onto timbers which are placed from the subgrader over to the side forms. The subgrader is pushed over to one side on these timbers and the front timber taken up so as to leave the subgrade clear for the trucks to pass.

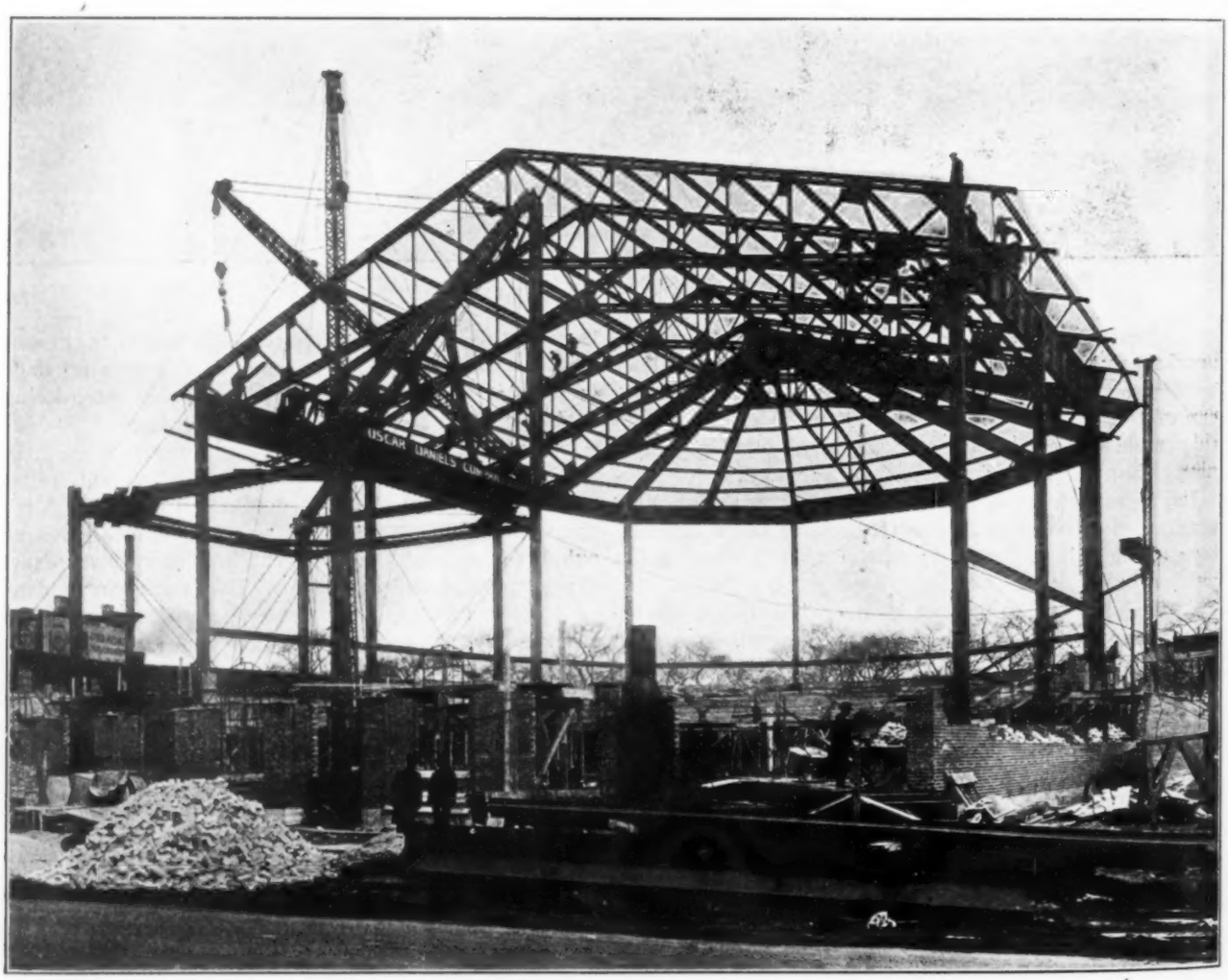
This operation takes but a few minutes, and yet it is one of the imaginary stumbling blocks in the minds of many contractors because they do not see how the subgrader is to be moved out of the road to allow passage of trucks. In these days of keen competition in road work it is the contractor who is able to squeeze out the last penny of profit from his job, and who is able to know his costs accurately, who will make the most profit. The fine grading item is one of the most important on any road job and deserves the most serious consideration from each contractor. He can not afford to neglect it.

NEW CHURCH IN CHICAGO WILL BE MEMORIAL TO MOODY

Steel Work for Big Auditorium Is Already in Place

PERPETUATING the famous name of Dwight L. Moody, Chicago is building a new Moody Memorial church at North Avenue and La Salle Street. It will contain one of the largest church auditoriums in the city and will rise to a height of 95 ft. The big trusses have a span of 114 feet and more than 300 tons of structural steel are called for by the specifications.

The walls of the building will be built of brick with terra cotta trim and the cost of the building will be approximately $1,000,000. The Oscar Daniels Company has the contract and expects to finish the big church by September 1st of this year. The photograph which accompanies this article shows the steel work well under way.



PLACING THE STEEL ON MOODY MEMORIAL CHURCH

INCREASING DAILY MILEAGE IN ROAD MAINTENANCE

By Substituting Tractors for Horses McDonough County, Illinois, Gains Time and Saves Money

THE maintenance of roads is always important and it is especially important in the spring when the highways are soft and show the effects of the wear and tear of the winter months.

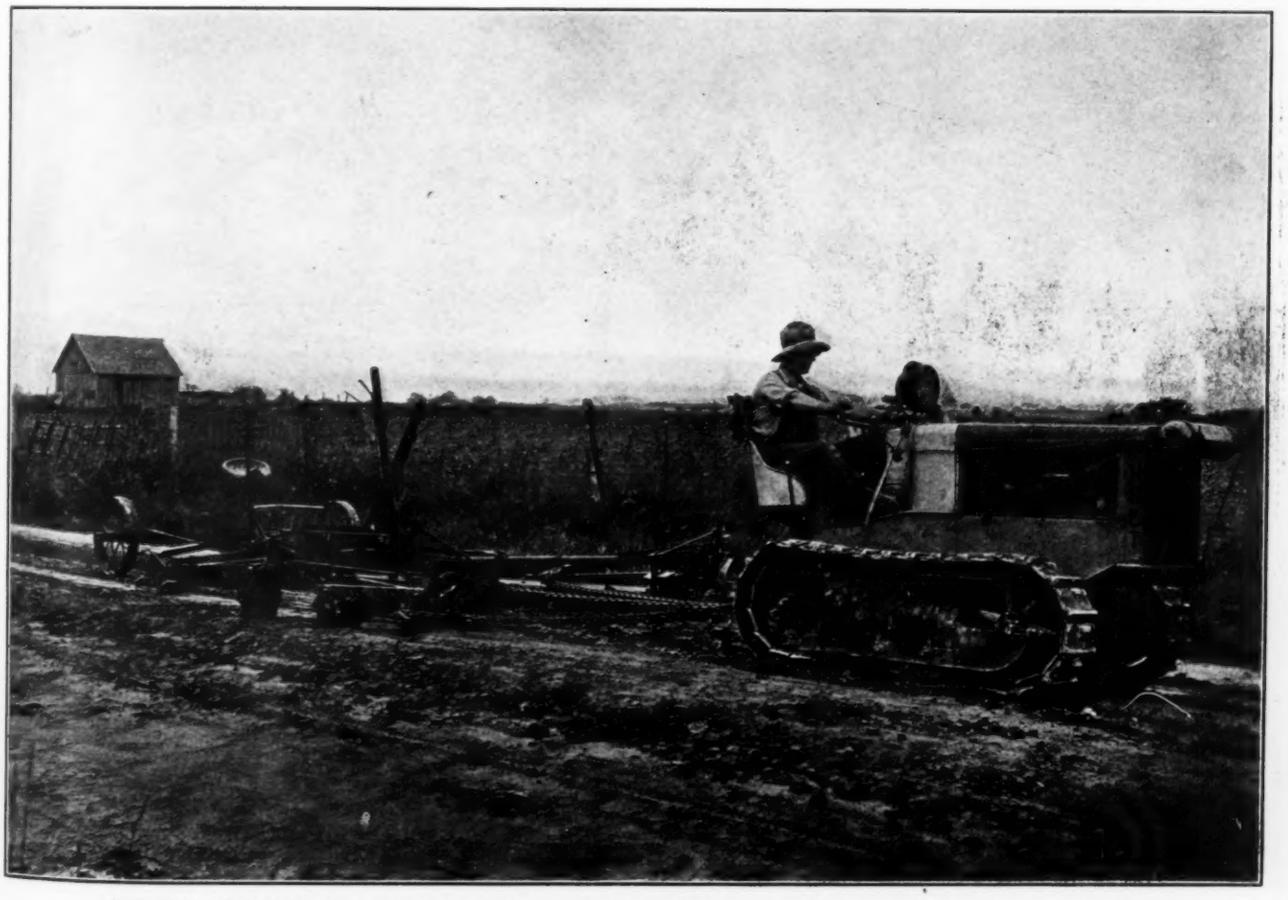
Maintenance also is somewhat more important in Illinois than it is in many other States, because of the softness of the soil. The soil which has enabled Illinois to produce great crops, unfortunately does not provide the best possible foundation material for roads.

McDonough County has about 200 miles of secondary highways consisting of gravel and dirt roads, which must be kept in condition. At the present time the county has been divided into maintenance districts, each maintenance unit taking care of about 40 miles of road. Five 2-ton tractors have been provided as the motive power for hauling the maintenance equipment. The use of tractors as opposed to horse drawn equipment, at once enlarges the mileage which each maintenance unit is able to care for.

The photograph which accompanies this article shows one of these maintenance outfits in action. The tractor is pulling a steel road drag, and thus equipped is able to make the round trip on a 12 or 15 mile stretch of road each day. In addition to hauling the drag, the tractor also is used for hauling a 6-ft. blade for clearing ditches, and a fresno for filling about culverts or bridge abutments, as well as various other jobs which are incidental to the work of road maintenance.

W. M. Bonham, the county superintendent of McDonough County, estimates that one man using a 2-ton tractor replaces 5 or 6 teams. He has prepared a few statistics in regard to the cost of the work. For example, the cost per mile with the tractor is 59 cents and with a man and 2-horse team, $2.08. On the basis of a year, the tractor costs from 47 to 63 cents a mile, while horses cost $1.66 to $2.50 a mile. In other words, the tractor maintains 22.5 miles per day at a cost of $13.20, as opposed to 3 miles a day with horses at a cost of $6.25.

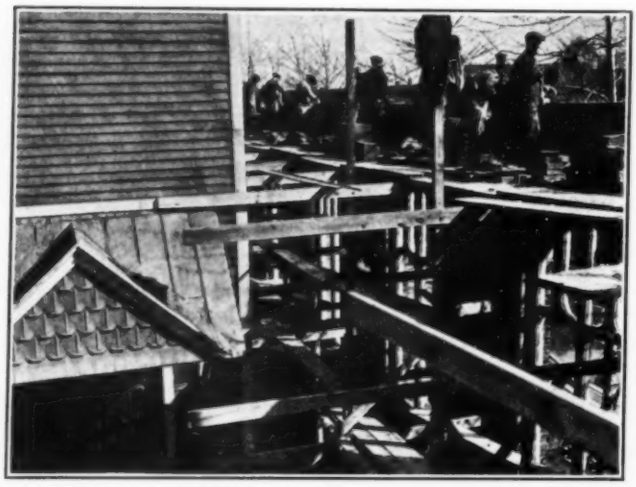
This increased mileage, made possible by the faster speed of the tractors, is of the utmost importance in the spring when the public demands that no time be lost in getting the roads ready for traffic. It is a good example of the economy in both time and money which can be effected by the proper use of machinery and the adoption of up-to-date methods.



GETTING McDONOUGH COUNTY'S ROADS INTO CONDITION. THIS OUTFIT EATS UP THE MILES

A CHURCH WITHIN A CHURCH

BUILDING a church outside another church, with services and all the other activities of the inside church uninterrupted is the accomplishment of Large & Hider of Kenmore, N. Y. The inside church is the Kenmore Presbyterian Church of Kenmore, a frame building now well along in its thirty-fifth year, and quite outgrown by the congregation.



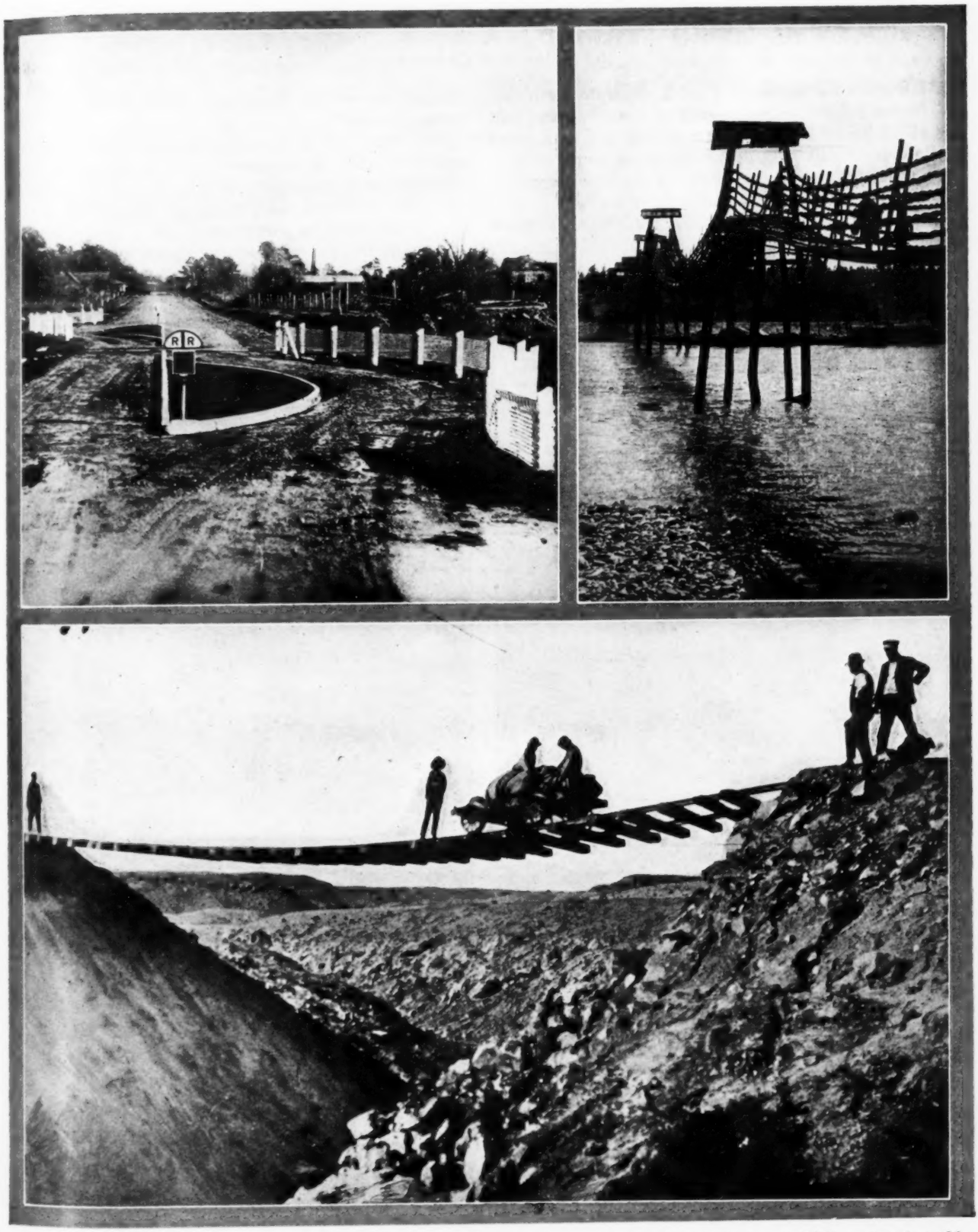
BRICKLAYERS WORKING ON NEW CHURCH

As the new church was to be built of brick and to occupy the entire lot, it was decided to start work without disturbing the old structure. When the steeple of the old church has been removed, the entire construction of the new building, except for the flooring, can be proceeded with. The old building, 90 by 50 ft., was set well back on the lot, and the choir portion of it is being temporarily retained. The new building, 90 by 80 ft., gives a comfortable clearance on all sides. As it will be without a cellar, the footings presented no particular difficulty, and the roof was designed to be self-supporting, being of trussed construction. A temporary frame wall will connect the ends of the new building with the choir portion of the old at the back.

When the time comes to tear down and remove the old building the material will be carried out through the doors and windows of the new one, which has grown up around it, and services will be interrupted only long enough to enable the floor to be laid.

THE OLD CHURCH STILL IN SERVICE WITHIN THE WALLS OF THE NEW EDIFICE

Three Crossings



Upper left—Florida is trying out a new method of making grade crossings safe. Every car which approaches this crossing must slow down. © *Keystone.*

Upper right—A Japanese bridge nicknamed the Dizzy Bridge. © *P. & A. Photos.*

Below—Railroading in Bolivia where fourteen successive washouts left the track with nothing to support it. © *Keystone.*

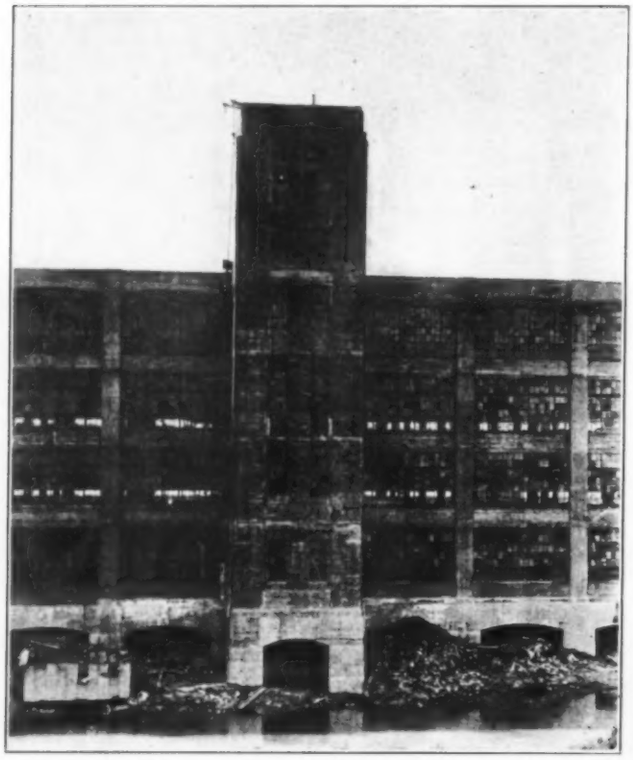
RUBBING DOWN EXTERIOR CONCRETE SURFACES

Improvement in Appearance More Than Makes Up for Moderate Cost of Work

By G. W. Maker,
Aberthaw Company

THE external appearance of a concrete structure is due primarily to the skill of the designer; and the effect as conceived by him should not be marred in the construction by departure from truth of line, irregularity of surface texture, or surface imperfections.

Forms for concrete must be skillfully designed



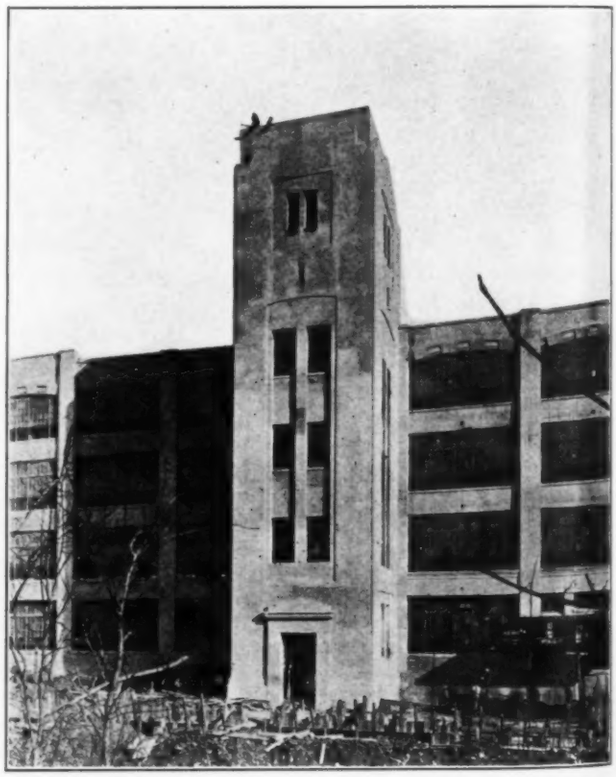
CONCRETE BUILDING IMMEDIATELY AFTER REMOVAL OF FORMS

using planed lumber of adequate strength assembled with care. Boards in columns should be vertical, those in beams horizontal, with a minimum of joints. Forms should be so designed as to readily permit removal of members from vertical surfaces leaving the weight-carrying members in place. Concrete must be thoroughly spaded and rodded to give a surface free from voids and with a minimum of irregularities.

Even when all these precautions are observed the appearance of concrete when forms are first removed is anything but pleasing due to natural discoloration of the concrete and minor irregularities. The improvement through a comparatively inexpensive surface treatment is nothing short of astonishing—so marked, in fact, that today there are few concrete structures, even those remotely located, which do not receive some degree of surface treatment.

The method of surface correction as practised by the Aberthaw Company of Boston is applied in two distinct operations, commonly called "First Rub" and "Second Rub."

The First Rub is more in the nature of a necessary operation than a surface treatment for appearance alone, as when forms are removed there are many surface imperfections, bolt holes, protruding tie wires, etc., which must be corrected in any event. This first treatment is applied immediately on removal of vertical forms, which is done as soon as practicable after concrete is placed, usually within 24 to 36 hr. At that time the concrete is still quite green. A mortar is made of one part cement and three parts screened sand, which is applied first to any holes or bad places by means of a wood float and a brush. At the same time the workman removes, by means of a multiple pick, any fins or other projections. The mortar is



THE RESULTS OF A THOROUGH RUBDOWN

then scoured over the entire surface. The concrete is sufficiently green so that this application becomes an integral part of the surface.

The Second Rub is done usually as the last operation when all other work on the building has been completed. The workmen start at the top and work down. This treatment is very simple, consisting only of the application of water and very thorough rubbing with carborundum stones.

The quality of the completed work depends largely upon the skill of the workmen, as, in both First and Second Rub hard work is essential and particular care must be used to leave the surface without showing lines where work started and stopped.

The accompanying photographs show a section of a concrete building immediately after the forms were removed and the same building after the final surface treatment.

The cost of this surface treatment varies somewhat according to the nature of the building, but is usually estimated at from 4 cents to 5 cents per square foot of surface, of which approximately 75 per cent covers the cost of first rub. Some contractors consider that the first treatment is a necessity and accordingly charge it in with the placing of concrete, carrying the cost of surface treatment at only about 1 cent per sq. ft.

CLEARING UP THE STOCK YARDS

Air Dump Cars Play Important Role in Removal of Waste in Kansas City

By C. P. Burton

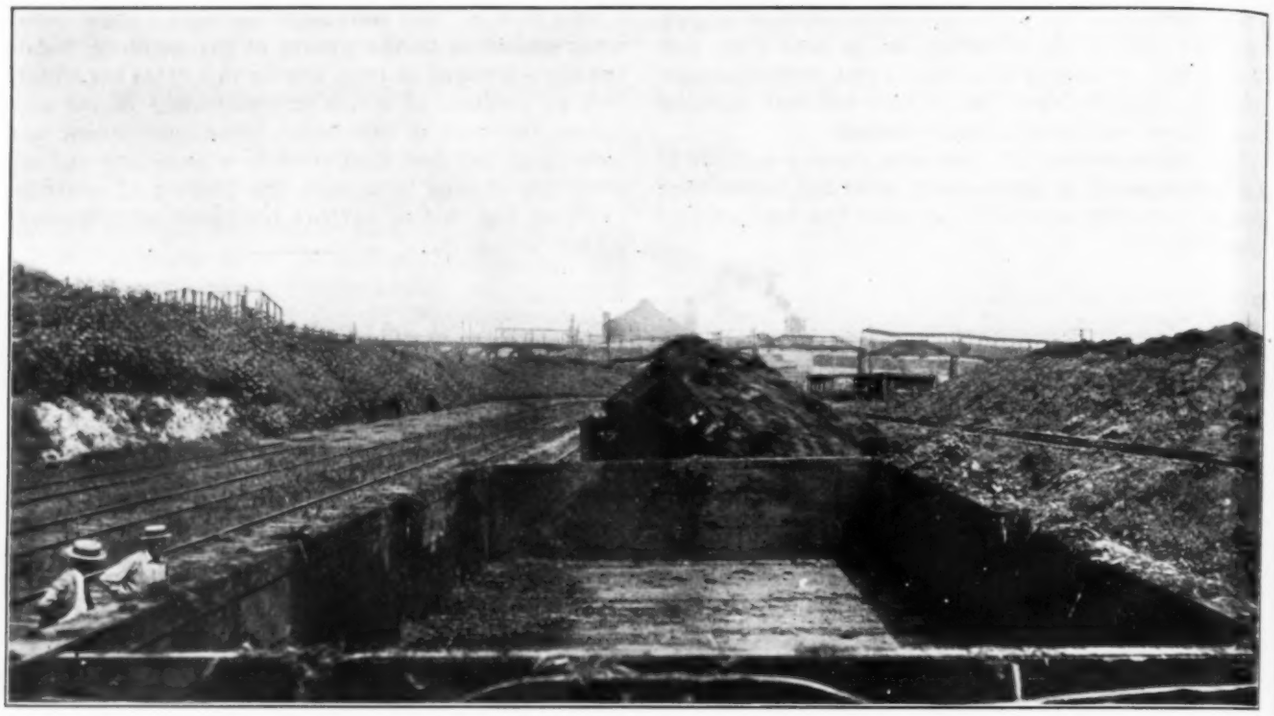
THE side dump car, developed as a necessary auxiliary to the operation of steam shovels, it being just as important to take away excavated material as to dig it, continues to invade the industrial field, where it is being used extensively entirely independent of steam shovel operation.

This development was inevitable, of course, for the air dump car will dump anything that is dumpable and, having made possible the economical disposition of material excavated by steam shovels, must be equally efficient in handling any other material by whatever means it may be loaded. The contractor's dump car, without which he could not build railroads or perform the other marvels of construction, handles coal in strip-mining operations; pig iron and scrap iron; slag from blast furnaces; cinders from boiler rooms; snow in railroad yards, and engages in a great variety of similar work.

It has remained for the Kansas City Stock Yards Company, however, to devote the air dump car to the most lowly of all pursuits, the handling of cleanings from cattle pens. The concentration of cattle at the Kansas City Stock Yards is enormous and the problem of cleaning the pens and disposing of the accumulating material is an insistent one. With it comes another problem. This waste product contains all the elements of fertility which should be restored to the soil.

The Kansas City Stock Yards Company has solved both problems by the use of air dump cars and end-dump wagons. A long loading platform, reached by an incline, has been built at a convenient point in the yards. Under this platform stand two trains of 20-yard air dump cars, each car spotted under a trap door in the platform above. Cleanings from the cattle pens are taken to the platform by two methods. In one, trains of small rocker cars pulled by storage battery electric motors are used as far as the base

UNLOADING ROCKER CARS. THE WASTE DROPS THROUGH TRAP IN PLATFORM TO AIR DUMP CARS BELOW

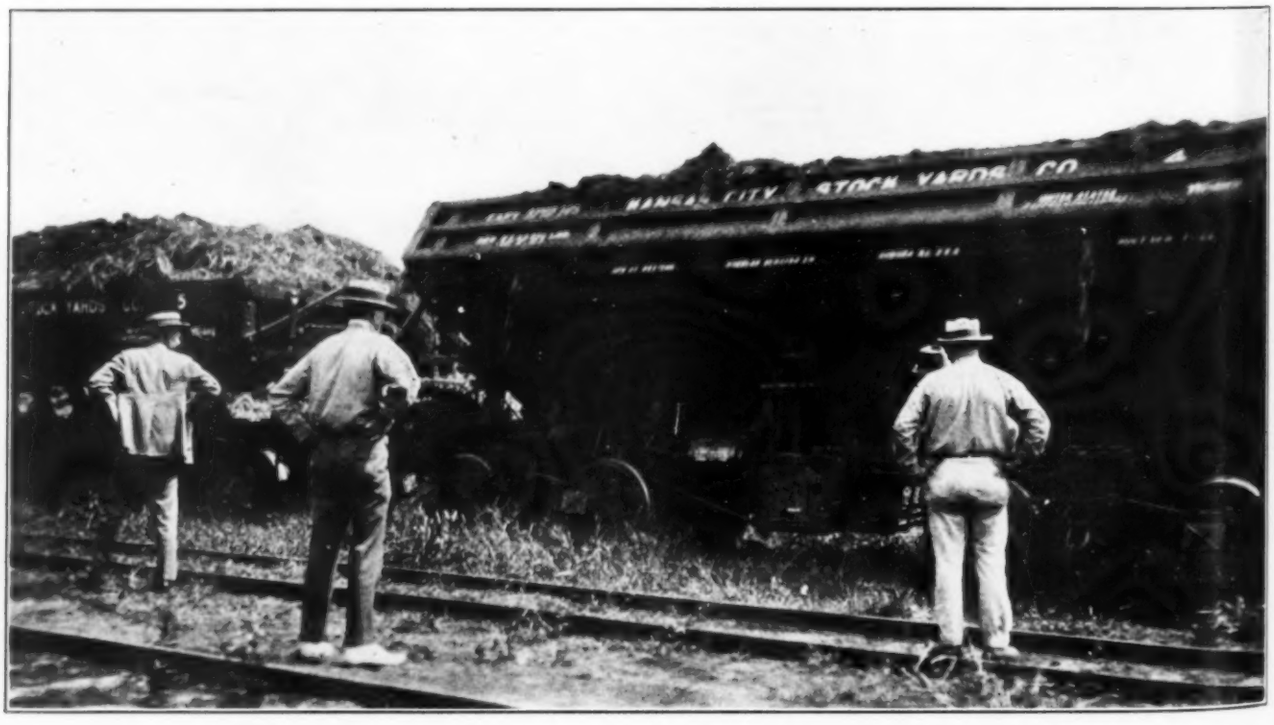


LOOKING ALONG A STRING OF THE BIG AIR DUMP CARS WHILE THEY ARE DISCHARGING THEIR LOADS OF WASTE

of the incline and from there are pulled to the top of the platform by cable. The other method is to use end-dump wagons pulled by team. In either case the load is dumped through trap doors into the dump cars which are waiting below.

When the dump car trains have been loaded they are taken to another part of the yards, where the material is dumped into a large pit, from which it is picked up by a clamshell crane and stacked in a huge pile. It is here left to rot, and later when work is slack, the rotted fertilizer is loaded into railroad gondola cars for distribution among farmers.

By this method the Stock Yards Company is able to handle the material very economically. The rotting process concentrates it so that much more rotted material can be carried in a car than in its raw state, and furthermore, the rotting prevents seeds of thistles and other noxious weeds from germinating.



ANOTHER VIEW OF THE AIR DUMP CARS UNLOADING

CRANE HANDLES PAVING JOBS

Removes Old Surface and Loads Materials for New Pavement

A STREET paving job in Elkhart, Ind., presented unusual difficulties because the ground consisted of from 6 in. to 12 in. of top soil covering 2 ft. to 3 ft. of marl and muck. Because of this condition it was necessary to make an average cut of 30 in. for the full 30-ft. width of the street.

On account of the softness of the ground the Highway Improvement Co. of South Bend, which was doing the work, decided on the use of the lightest excavating equipment available. A motor truck mounted crane equipped with a ½-yd. clamshell bucket, therefore was put on the job.

The underlying muck was so soft that when the bucket was dropped the sidewalks quaked. It would have been an impossibility to have used a heavier type of excavator on this work.

The first day on the job the truck mounted crane dug 300 yd. of material, which was placed in trucks and hauled about the neighborhood to fill depressions in yards, etc.

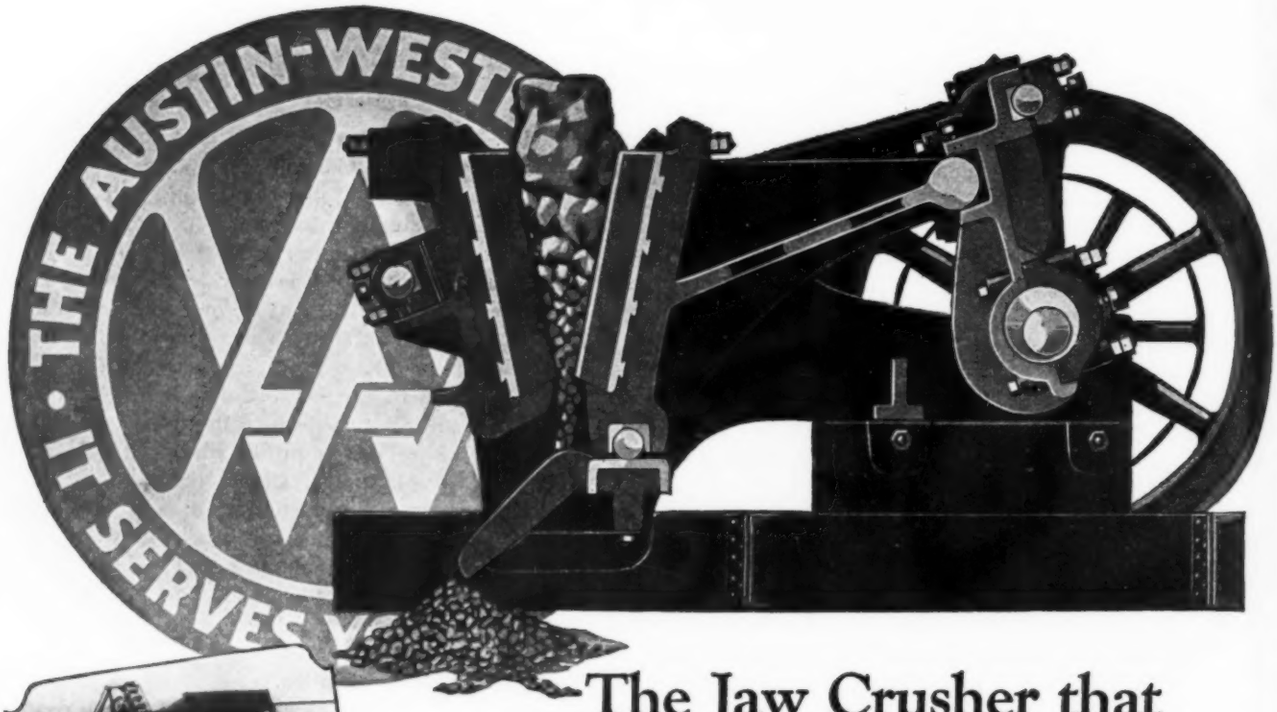
The subgrade then was covered with 1-in. to 2-in. stone, which was delivered at a siding about a half-mile away. The materials generally came in 3 or 4 cars at a time. An added advantage in having a motor truck mounted crane on the job was that it could be driven from the grading job to the siding in a few minutes, unload the cars into trucks in 4 to 5 hours and speed back to the grading work.

Probably the mobility of the unit is better shown by a job done earlier in the year. The contract called for 29 miles of road surfacing which was done at the rate of 1½ miles a day.

The crane unloaded the stone chips from the cars on the nearest siding into 5-ton dump trucks. The truck traveled along the highway dumping off fair size stock piles of chips at regular intervals. Later one of the trucks was equipped with a chip spreader on the rear end and sent out on the job with the crane. The crane loaded the truck at the first stock pile and the stock pile spacing was such that one pile held sufficient supply to last the spreader until the next pile was reached. Here the crane again loaded the trucks from the stock piles.

The crane operator was incapacitated for two days while on this job and 15 laborers were hired to accomplish the work of the crane.

THE SOFTNESS OF THE MATERIAL IS WELL ILLUSTRATED BY THE DEPTH TO WHICH THE WHEELS OF THE SMALL TRUCK HAVE SUNK



The Jaw Crusher that is Different

And what this Difference means to You

THE important thing is not so much the fact that the Western-Aurora Crusher has broken away from, and left behind, the old Blake Type Jaw Crushers with their springs and toggles as it is the fact that the unique Western-Aurora design means much to you in the way of service and satisfaction.

Space won't permit anything like a complete description of the now famous Western-Aurora two-blow stroke, but the coupon will bring you a catalog that tells all about it. What counts is that as a result of this continuous two-blow stroke and freedom from springs and toggles a Western-Aurora Crusher in your plant means:

Greater output,
Fewer delays,
Less power required for operation, and
Longer life for the crusher itself.

The catalog explains why you are sure to enjoy these advantages from

The Jaw Crusher that is Different.

When choosing a crushing plant, your first thought is naturally of the crusher itself—but elevator, screen and bin are of almost equal importance. This fact is always in the minds of Western engineers, and as a result you will find each unit in the Western-Aurora Crushing and Screening Plant on a par with the crusher, and ready to give you the same standard of service.

You will find many worth while ideas and much valuable information in this catalog. Better clip the coupon now, while you think of it.

I would like the catalog.

_____

_____

_____

W-A

THE AUSTIN-WESTERN ROAD MACHINERY CO.

CHICAGO